**PHYSICS 221 A SYLLABUS**

**FALL 2017**

 Subject Weeks Weeks (cum)

 1) Intro, continuous and discreet symmetries 2.0 2.0

 2) Quark model, particle classification, 2.5 4.5

 masses, magnetic moments

 3) Passage of radiation through matter 1.5 6.0

 4) Detector technology 1.5 7.5

 5) Techniques of High Energy Astrophysics 1.5 9.0

 6) Hadron Collider Physics 1.0 10.0

There will be three written homework sets, associated with modules 1)-4). These may be done collaboratively. There will also be a computer project associate with module 5). This should be done individually. You may discuss qualitative approaches, results, etc., but everyone must write their own program (in whatever language they choose!).

Course Web Site:

http://scipp.ucsc.edu/~schumm/ph221/Physics\_221A.html

Resources:

Burcham and Jobes, Nuclear and Particle Physics

 Good pedagogical text for modules 1) and 2)

Leo, Techniques for Nuclear and Particle Physics Experiments

 Good pedagogical test for modules 3) and 4)

Particle Data Group Review

 Excellent reference resource for everything, especially modules 3) and 4).

T.C. Weeks, Very High Energy Gamma Ray Astronomy

 Good pedagogical reference for module 5)

Seiden, Particle Physics: A Comprehensive Introduction

 Good general reference, especially module 6)

Thomson, Modern Particle Physics: General reference; new, haven’t yet reviewed, but have heard good things!

Halzen and Martin, Quarks and Leptons

 Classic treatise on particle physics; somewhat terse

Chan and Goldhaber, The Experimental Foundations of Particle Physics

 Shows and discusses the seminal papers. Unique among texts, and

 valuable.

Aitchison and Hey, Gauge Theories in Particle Physics

 The best I've found on the topic. Not necessarily for 221A,

 but just so you know.

Schumm, Deep Down Things

 You might be surprised how a non-mathematical treatment can cement

 certain concepts.